

BCF solutions



DOG



DIGITAL OBSERVATION GUARD Radar Interface Kit User Manual

Version 1.1

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System Description

The DOG Radar Interface Kit provides the capability to remotely power and connect to a DOG radar sensor and to display and configure the radar data on the base station laptop. The DOG radar interface kit will power a Spotter radar out to 150m with a single (primary) CAT-5 cable and up to 500m using a second CAT-5 cable. The figure below shows the various components in the DOG Radar Interface Kit.

- ① Radar Remote Module
* NOTE: Remote Modules may already
integrated onto the Radar.
- ② Radar Base Station
- ③ 40Vdc Power Supply
- ④ AC Power Cord
- ⑤ User Manual

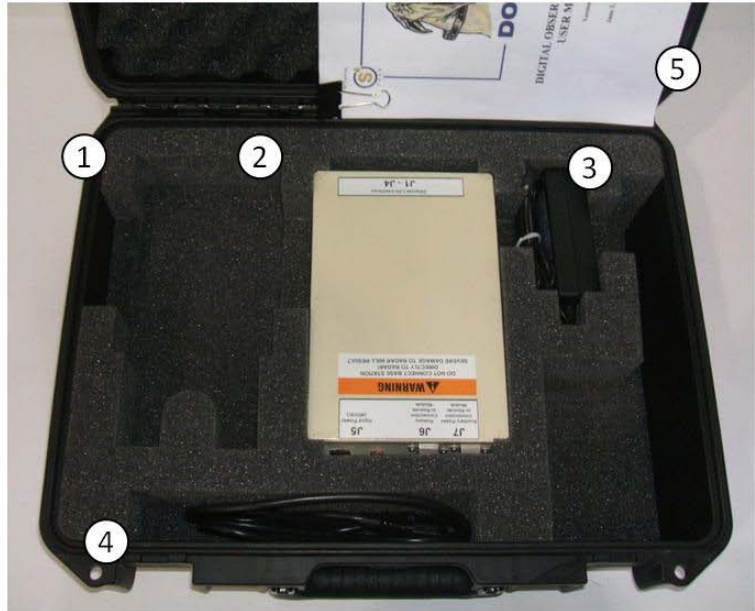


Figure 1: Radar Kit with Military Grade Case

Each case is identified by a decal just above the handle as shown in the figure below.

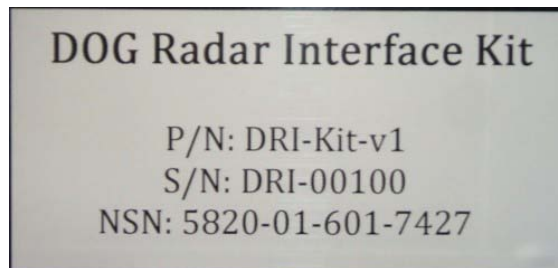


Figure 2: Radar Interface Kit Identification Label

Connecting the Radar to the Base Station

Begin connecting the Radar to the Base Station by removing the weatherproof connector gland for the connector labeled J1. Run a CAT-5 cable through the weatherproof gland and plug the RJ-45 connector into J1 as shown in the figure below. If the cable distance being run from the radar to the base station is 125m or less in length then J1 is the only connection that needs to be made between the radar and the base station. In this case it is extremely important to put a small piece of CAT-5 cable into the other cable gland to insure an environmentally tight seal.

*****WARNING*** DO NOT REMOVE THE WEATHERTIGHT CONNECTOR ON THE BOTTOM OF THE RADAR HEAD. CONNECTING THE PRIMARY OR SECONDARY CABLES DIRECTLY INTO THE RADAR MAY DAMAGE THE RADAR.**



Figure 3: Radar Remote Module CAT-5 Primary Connections (125m or less)

When connecting the Radar to the Base Station over distances between 125m and 450m a second CAT-5 cable needs to be run and connected to the J3 connector to extend the operational capabilities as shown in the figure below.

*****WARNING*** DO NOT REMOVE THE WEATHERTIGHT CONNECTOR ON THE BOTTOM OF THE RADAR HEAD. CONNECTING THE PRIMARY OR SECONDARY CABLES DIRECTLY INTO THE RADAR MAY DAMAGE THE RADAR.**



Figure 4: Radar Remote Module CAT-5 Auxillary Connections (125m -450m)

Once the CAT-5 cables have been plugged into the the Radar Remote Module the other end of the cables can be connected to the Radar Base Station. The primary cable that was plugged into connector J1 on the Radar must be plugged into the connector labeled J6 on the Base Station. If second cable is plugged into

connector J3 on the Radar then connect the other end of this cable into the connector labeled J7 on the Base Station.



Figure 5: Connecting Radar Remote Module to Base Station

It is highly recommended to attach a grounding wire to the grounding post on the Radar Base Station and clamp the other end to a large metal structure, pipe, or electrical outlet ground as shown in the figure below. This will help to protect the hardware and user against lightning. Next plug in the 40Vdc adapter into the J5 connector on the Radar Base Station to power up the radar.



Figure 6: Powering Up the Radar Base Station

With the Radar and Radar Base Station powered up connect a CAT-5 cable to any of the connectors labeled J1-J4 on the Radar Base Station to the Base Station computer.



Figure 7: Connecting Radar Base Station to Computer

Connecting the Radar GPS

To connect the optional GPS to the DOG Radar first plug in the GPS connector into the Radar as shown in the figure below. The GPS contains a magnetic strip that will allow it to easily attach to the top of the radar and stay without any mounting hardware.

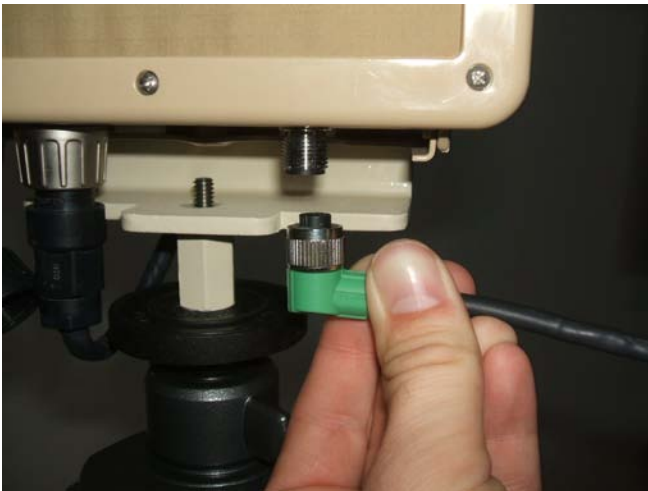


Figure 8: Connecting GPS to the Radar

Connecting to the Radar

Once everything is properly connected, power up the system. The Radar takes approximately thirty seconds to a minute to fully power up and initialize. Use the Base Station laptop to open up a Google Chrome web browser by double clicking on the Google Chrome icon as seen in the figure below. The **IP address of the Radar** is set to **192.168.0.20**. The Chrome browser is set to automatically load the Radar's configuration page when it is run. The **IP address of the Base Station laptop** is set to **192.168.0.3**.

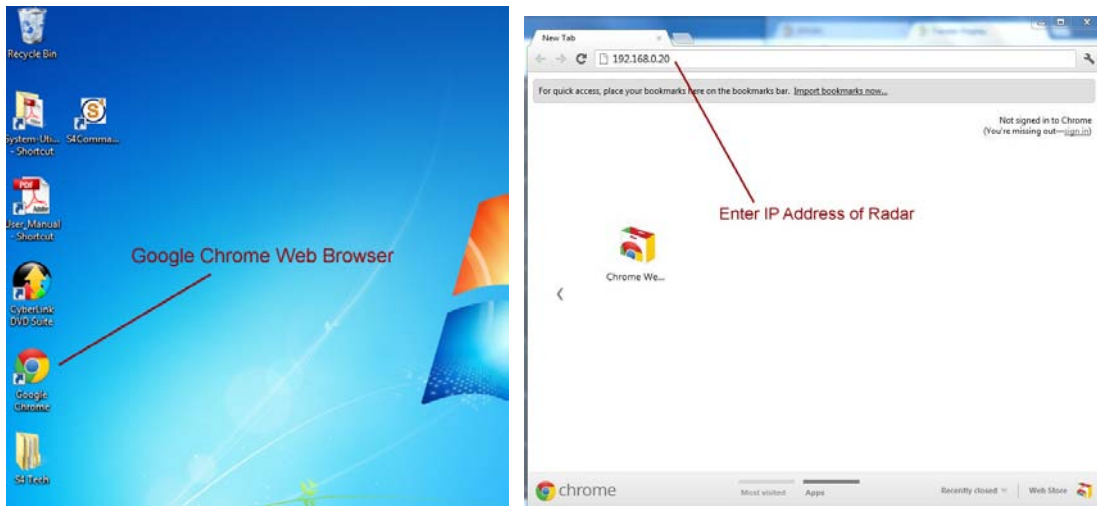


Figure 9: Connect to Radar with Chrome Browser

QuickStart Configuration

Whenever a Radar is installed in a new location it is important to configure several radar settings. Click on the “Quick Start” tab at the top of the web browser to see the screen in the figure below. The **Environment: Wind Speed** setting is used to help eliminate false alarms generated by the wind blowing trees and other objects within the Radars field of view. Increasing the environment wind speed reduces the sensitivity of the Radar. It is recommended to start with a slow wind speed and gradually increase the setting until all false alarms stop.

The **Orientation: Azimuth Setting** is critical to properly aligning Radar's angle relative to north. Type in the angle (in degrees) relative to true north that the radar is pointing.

The **Location: Lat, Long, Elevation** setting is critical for determining the exact location of the Radar. If the GPS module is connected to the Radar then the location information will automatically be uploaded to the software. The location information can also be manually entered should it be necessary. *Note** If possible, it is a good idea to verify the GPS location of the radar especially if the map based version of the software is to be used.*

Once all of the Radar settings have been properly configured it is important to click on the “Save” button at the bottom of the webpage to save all of the settings. *Note** Consult the Radar's user manual for a more detailed description of these settings as well as many other non-critical settings.*

SpotterRF SP0455 QuickStart Network Outputs Advanced Tracker

QuickStart [User Manual \(PDF\)](#) [Quick Start \(PDF\)](#)

Environment
 Wind Speed: Drag left to increase sensitivity or right to decrease false alerts due to wind.

Orientation
 Azimuth Angle: Angle relative to north (90° is East).

Location
 MGRS: This will be converted to GPS for use on the spotter.
 Lat: -90.0 to 90.0
 Long: -180.0 to 180.0
 Elevation: In meters (HAE WGS-84).

Time
 UTC: Current time on the spotter.
 Click acquire to use PC's time.
 'Sync with GPS' will update from GPS regularly.

Figure 10: Radar Software Quickstart Config Tab

Network Configuration

As mentioned above, the **IP address of the radar** is set to **192.168.0.20** and the **subnet mask** is **255.255.255.0** as seen in the figure below. If for some reason this address were to be changed or corrupted, the user can connect to the **default ip address of the radar** at **169.254.254.254**. In this case the Base Station laptop must be set to the same subnet 169.254.254.xxx.

SpotterRF SP0455 QuickStart Network Outputs Advanced Tracker

Network

Custom Address
 IP Address: Static address for the unit. Ex: 192.168.1.15
 Netmask: A bitmask to divide networks into subnets. Ex: 255.255.255.0
 Gateway: A network node used to access other networks. Ex: 192.168.1.1

DHCP Address
 IP Address: Overrides user-set IP if in same subnet
 Netmask:
 Gateway: Overrides user gateway if set
 Hint: Auto configure DHCP + Dynamic DNS using network.json Push Notification

Fixed Address
 Default address: Always accessible when plugged directly into Spotter.
 Netmask:
 Gateway:

Figure 11: Radar Software Network Config Screen

Viewing Radar Data

Once the Radar has been properly setup click, on the “Tracker” tab in the upper right hand corner of the webpage. The Radar’s Tracker Display page will open up in a new browser window as shown in the figure below.

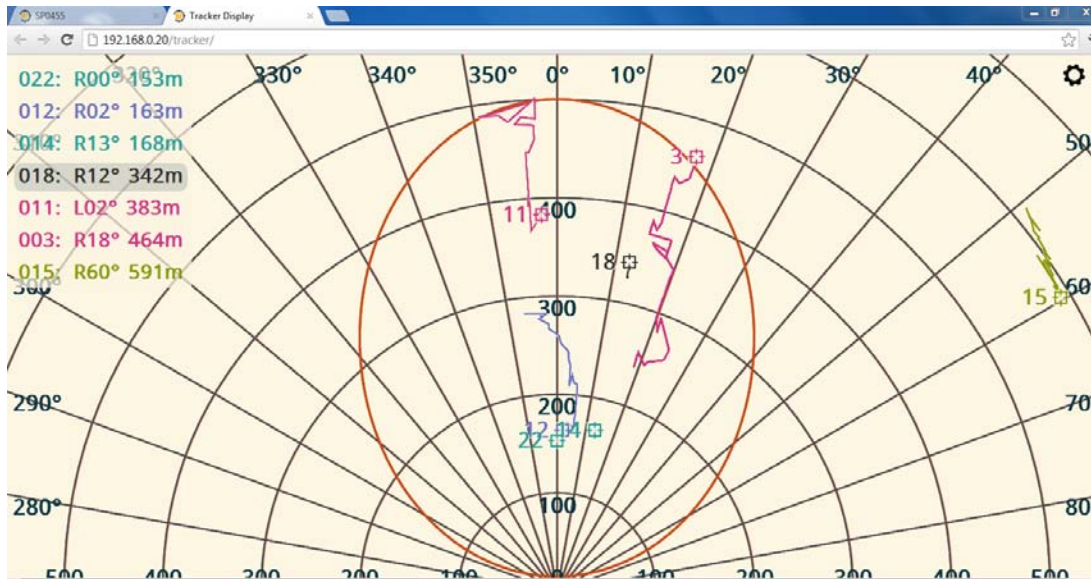


Figure 12: Radar Tracker Display Screen

The grid display shows the range and angle contours along with the radar personnel detection pattern. Target tracks are displayed as unique colored squares with an adjacent track ID as seen in the figure above. The range and bearing associated with the track ID are displayed in a matching color in the upper left or right corner of the grid. The display can be configured by clicking on the SpotterRF icon in the upper left corner of the grid. When clicked on, the icon expands into the high level configuration menu options as seen in the figure below. Click on each option to set up background color, line and text sizes, grid labels, target display options, etc. Mask zones can also be set up so that no detections occur in those areas.

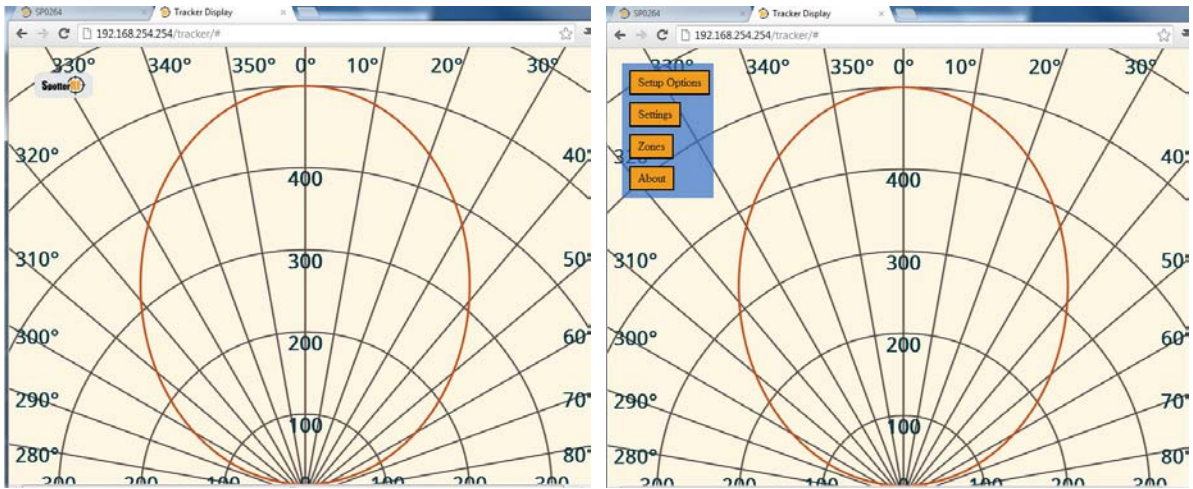


Figure 13: Display Config Menu

Using the S4 Tech Command and Control Software Application

S4 Tech has developed a command and control software application that combines maps, grids, and icons with Spotter radar, DOG Base Station, DOG standard camera, and DOG PTZ camera interfaces. The software allows the user to select a default grid display or to import a map image in any standard image format. Fixed camera, PTZ camera, sensor, and radar icons can be placed on the grid or maps and alarms are indicated both visually and audibly. Radar targets are displayed with persistence tails.

Configure the Radar Outputs

The first step in running the S4 Tech Command and Control (C2) application is to configure the radar to send target data to that application. This is done in the Outputs tab of the radar browser page as seen in the figure below. Use the settings in the figure to set up radar target data communication to the laptop running the S4 C2 application. Make sure that the IP address is set to match that of the laptop.

The screenshot shows the SpotterRF configuration window. At the top, there's a header with the SpotterRF logo and a text box containing 'SP0264'. To the right are five tabs: 'QuickStart', 'Network', 'Outputs', 'Advanced', and 'Tracker'. The 'Outputs' tab is selected.

Google Earth

Kml Timeout: The number of seconds after a track stops before it is cleared from the KML file

Push Notifications

Resource: [Download current tracks.json](#)

Protocol	IP	Port	Parameters	
<input type="text" value="http"/>	<input type="text" value="192.168.0.20"/>	<input type="text" value="4444"/>	<input type="text" value="ex /foo?bar=baz"/>	<input type="button" value="Add Subscription"/>

Update Rate seconds

tracks.json
<http://192.168.0.3:4444/> [\[view details\]](#)

Figure 14: Configure the Radar for S4 C2 Software

Note** To check that the rada is outputting target data open another Google Chrome browser page and enter the following url: 192.168.0.20/tracks.json. You will see the latest serial message sent by the radar in the browser window.

Running the S4 C2 Application

Once the radar outputs have been configured to The run the S4 Tech Command and Control application double-click on the S4 Command and Control desktop icon as indicated in the figure below to launch the application.

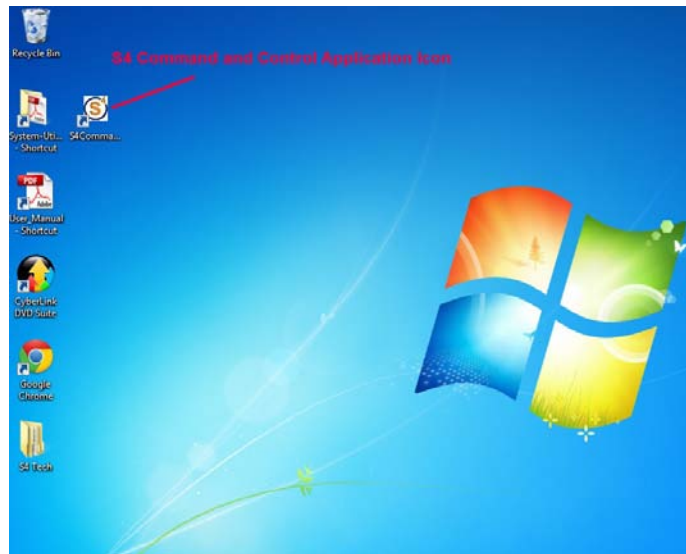


Figure 15: Start S4 C2 Software

The S4 Command and Control application will open up in a new window. *Note** If no DOG Base Station or PTZ camera are connected to the laptop then it may take a minute or two before the application opens as it searches for connected devices.* Once open the user can click on the Help menu on the upper left to see a full set of help instructions for the application. The main page of the help menu is seen in the figure below.

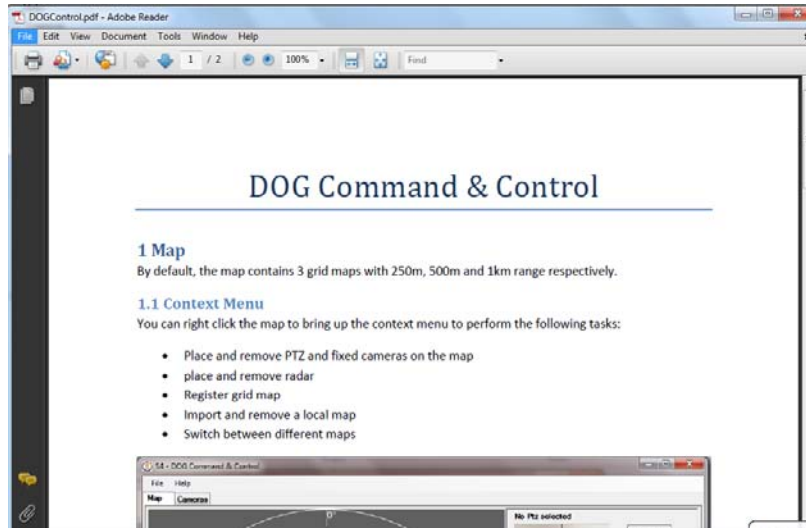


Figure 16: S4 C2 Help Document

The Map Tab

The figure below shows the Map tab of the application. It contains a default 500m grid with a radar, fixed camera, and PTZ camera placed on the grid. The radar personnel detection pattern is shown as yellow oval and it points in the direction of the user entered bearing for the radar. The PTZ and fixed camera fields of view and shown as green and blue fans respectively, and also point in the direction of the cameras. Motion detection or sensor alarms from a connected DOG Base Station DVR will cause the

fans to turn red and flash along with an audible tone that can be disabled. Video from the corresponding alarms can be seen on the DVR under that camera's channel. The virtual joystick in the upper right corner of the page will control one or more connected PTZ cameras.

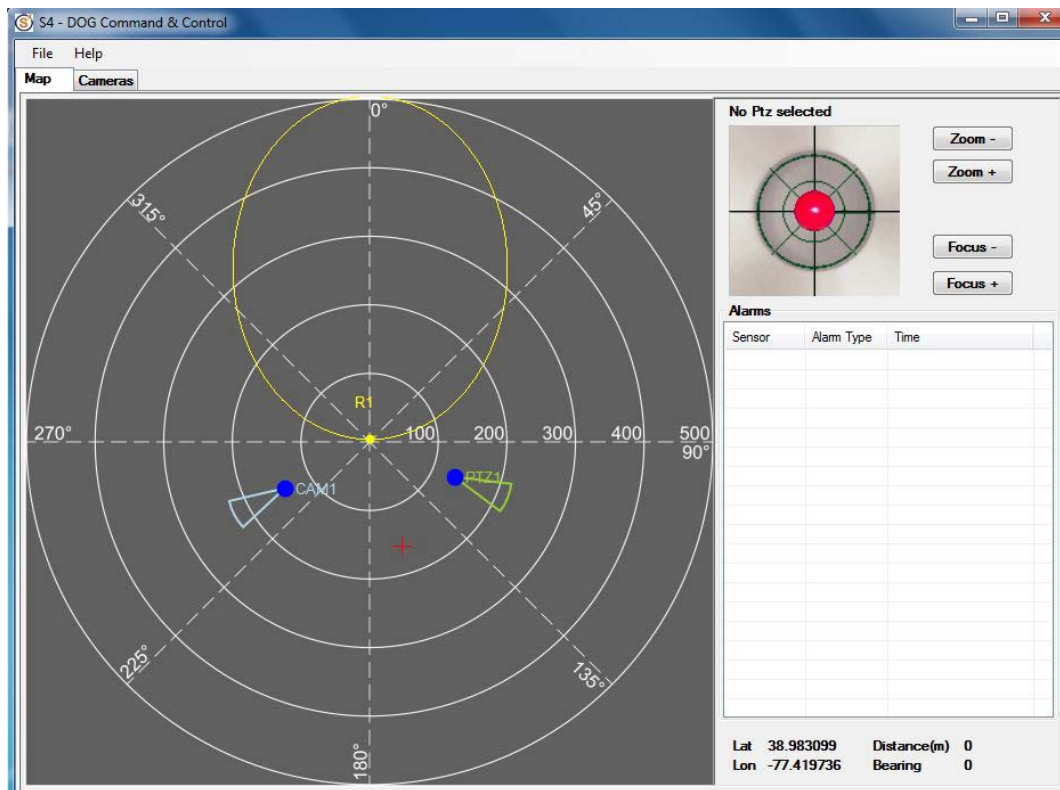


Figure 17: S4 C2 Map Tab with 500m Default Grid

Changing or Loading a Map

The default grids or maps can be changed by right clicking anywhere on the map or grid graphic and using the pop-up menu as seen in the figure below. Maps can be added with the **Import Map** option or removed with the **Remove Map** option. See the Help menu for more details on this process. The default grid can be changed to a 250m or 1000m grid or to a default map by selecting the **Switch Map** option in the pop-up menu and then selecting the desired option in the submenu. Cameras and radars are added to the map using the pop-up menu also as seen by the options in the figure below.

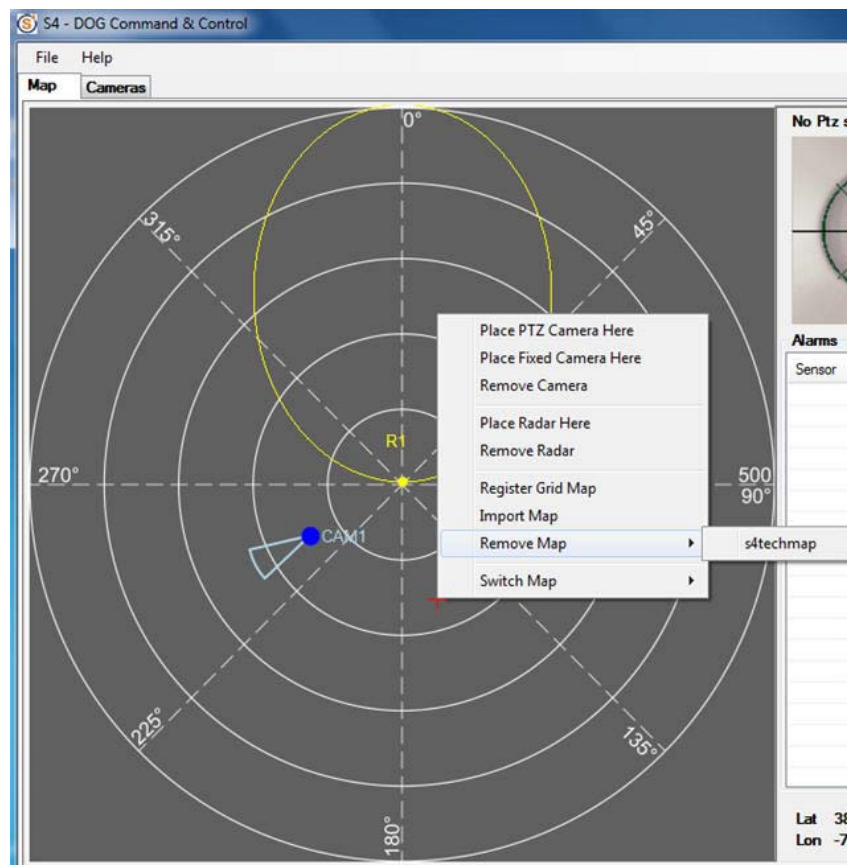


Figure 18: Main Config Menu on Map Tab

The default map option is shown below.

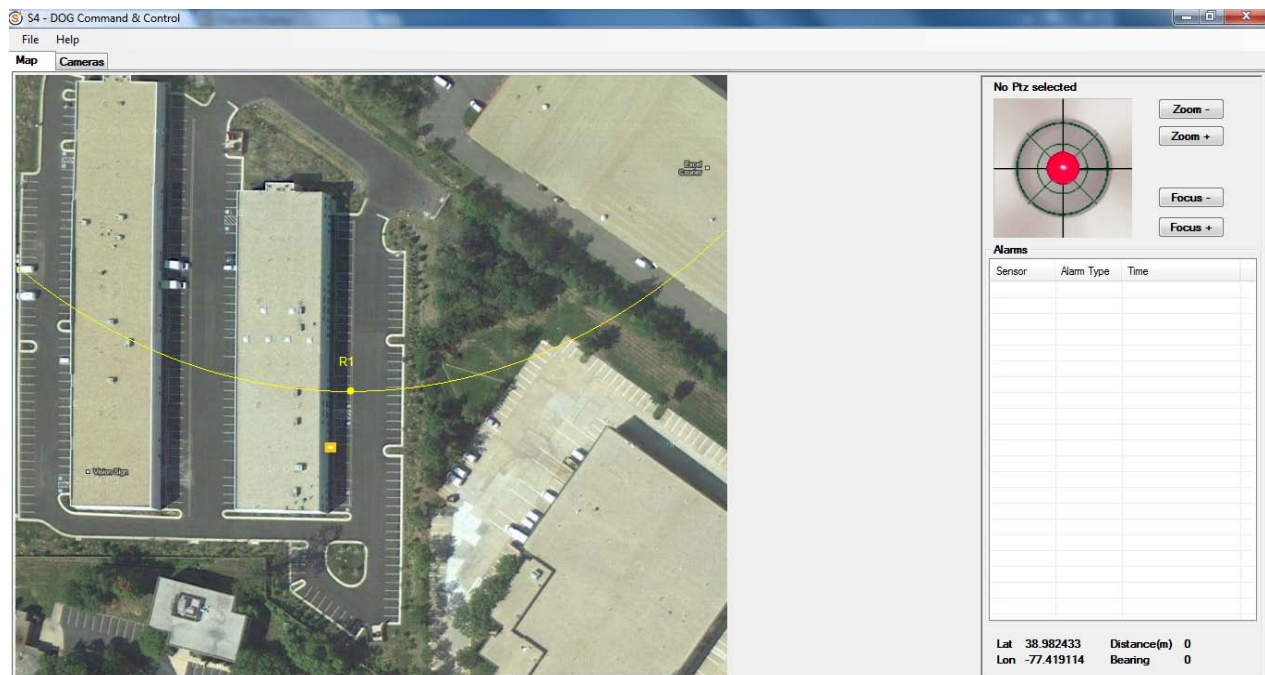


Figure 19: Default Map

Configuring the Radar Position

It is important that the radar bearing and position on the map or grid correspond to the Orientation [azimuth angle] and Position [Latitude (Lat),Longitude (Long)] shown in the radar browser or the targets will not display in the right locations. The radar bearing is entered by the user when the radar is first placed onto the S4 C2 map and can be seen by the direction that the radar pattern is pointing as seen in the figure below. The user should verify that this matches with the **Orientation:Azimuth Angle** settings on the **Quickstart** tab of the radar browser. The radar location on the map is determined by where the user clicks the mouse before right clicking the pop-up menu to add the radar. The Lat/Long location of the mouse click can be seen in the bottom right of the screen as shown in the figure below. The user should verify that this matches with the Position: Lat/Long settings on the Quickstart tab of the radar browser.

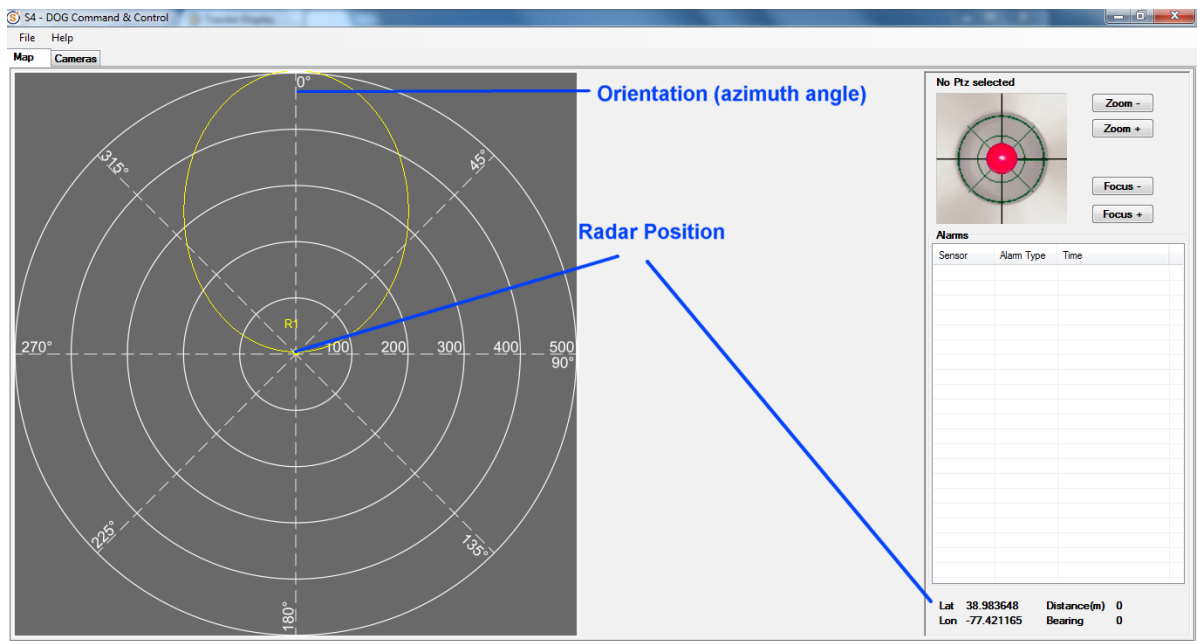


Figure 20: Radar Bearing and Position Verification

The Cameras Tab

The cameras tab is the where fixed cameras, PTZ cameras, and DVR units are set up in the S4 C2 application as seen on the main tab in the figure below. For each component that is added, submenus will pop up and the appropriate parameters must be entered by the user. PTZ cameras have IP addresses, TCP ports, DVR channel, and motion detection parameters that must be entered. Fixed cameras have DVR, channel, and motion detection parameters. DVR's have IP addresses and maximum number of channels to be entered as seen in the figure below. As on the map tab, the virtual joystick in the upper right corner controls one or more attached PTZ cameras. Please refer to the Help menu in the S4 C2 application for more operational detail.

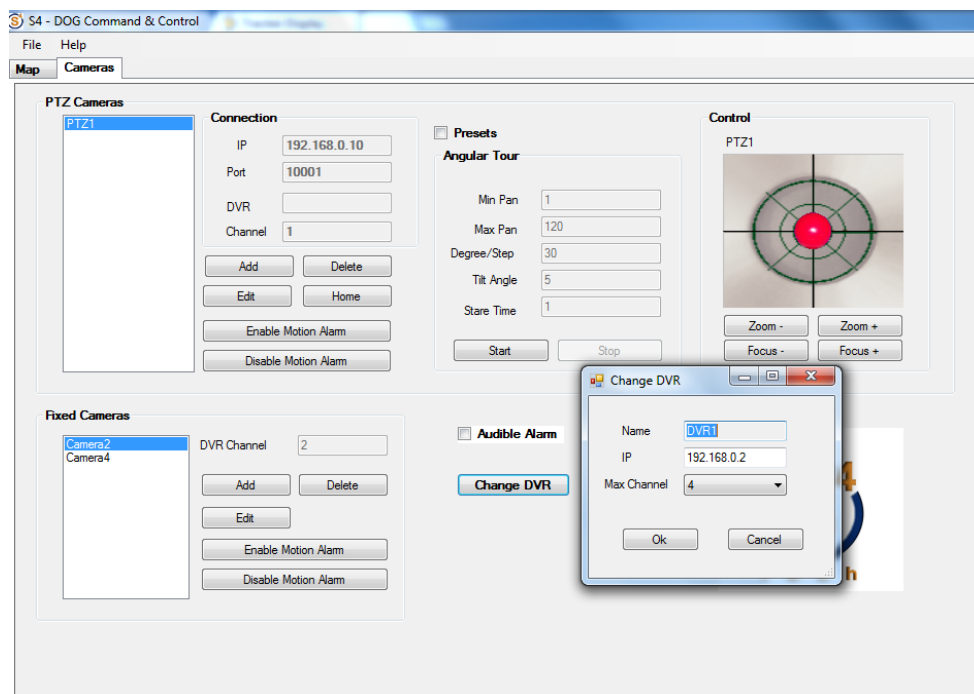


Figure 21: Camera and DVR Configuration

Exit the Application

To exit the S4 C2 application, click on the **File** menu and then select **Exit** or simply click on the X in the upper right corner of the application window and the application will shut down.

Troubleshooting

1. **The radar unit does not appear to power up.** It may take several minutes for the data link to establish a connection with the radar. Also check the length of the CAT-5 cable connecting the radar. If it is over 100m then two CAT-5 cables are required out to 300m.
2. **The radar does not appear to connect to the system.** Open the Google Chrome browser window on the Base Station Processing Module and type in <http://192.168.254.254> to connect to the radar.

Contact Info/Tech Support

For questions or support, please see our website at: www.bcfsolutions.net or contact: admin@bcfsolutions.net, 703-956-9088.

For user manual or other technical downloads go to the customer tab on the website and login with the following: **user:** *customer* **password:** *2004-S4Tech*. This being a new product there may not be much information on the customer page at this time.